

TAPE CARTRIDGE MEDIA ACCESS DOOR**BACKGROUND OF THE INVENTION**5 **1. Field of the Invention:**

The present invention deals generally with storage of data, and particularly with a media access door for tape cartridges.

10 **2. Background of the Invention:**

Magnetic tape is a useful storage medium for many purposes, such as archiving and online storage of data. Magnetic tape reels typically reside in a cassette or cartridge. Data is read from or written to a cartridge by
15 inserting it into a drive. Such drives include a read/write head that the magnetic tape is passed across.

Normally, cartridges for magnetic tape include a door to protect the tape from damage and exposure. When a cartridge is inserted into a drive, the door is opened,
20 exposing the tape to the drive interior. A threading mechanism is required to draw tape from the cartridge so it can be placed in proximity to the read/write head. The threading mechanism typically draws the tape from the supply wheel in the cartridge and loads it onto a take up
25 reel located in the drive.

Several factors drive design of threading mechanisms, including tape path complexity, length, and available clearance within the drive. A leader mechanism of some type is typically employed, which attaches to one
30 end of the media within the cartridge. In order for a

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drive to access the leader, and thus the tape, the
cartridge door must be opened. However, due to
limitations of space within the drive, it is desirable
that the mechanism for opening the door does not require
5 a large amount of space within the drive. For example, a
hinge mechanism that causes a panel on the cartridge to
swivel outward, to thereby expose the tape and leader,
requires internal drive clearance. It would therefore be
an improvement on the state of the art to provide a means
10 of accessing the tape within a cartridge that does not
require excess clearance within the drive.

SUMMARY OF THE INVENTION

The present invention provides a tape cartridge media access door. In a preferred embodiment, the
5 innovative access door uses a pliable member (preferably a belt) and a slider mechanism to pull open a sliding panel of the cartridge as the cartridge is inserted into a drive. Preferably, the slider of the cartridge engages a tab of the drive such that as the cartridge is
10 inserted, the tab moves the slider. The slider is attached to the belt, which pulls open the access door.

Use of a pliable mechanism for opening a sliding door allows the cartridge to be opened without requiring added clearance within the drive. It also allows the door
15 and slider to be placed on different faces of the cartridge without the need for a hinge or other added complexity to the design. In addition, by supplying a cartridge with a door that opens using the insertion motion of the cartridge, the complexity of gaining access
20 to the magnetic tape is reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

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Figures 1A and 1B show two views of a preferred embodiment with closed tape access door.

Figures 2A and 2B show two views of a preferred embodiment with an open tape access door.

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Figure 3A shows a tape and drive according to a preferred embodiment.

Figure 3B shows a tape insert into drive according to a preferred embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figures 1A and 1B show an innovative tape cartridge according to a preferred embodiment. **Figure 1A** shows cartridge **100** from a rear view, wherein the rear of the cartridge **100** is first to be inserted in a drive (not shown). At one rear corner of cartridge **100** is shown cartridge slider **102**. Slider **102** is in a closed position. At another rear corner of cartridge **100**, cartridge door **104** is shown in a closed position.

Figure 1B shows cartridge **100** from a different corner rear view than **Figure 1A**. Cartridge slider **102** is indicated at a first rear corner, while cartridge door **104** is shown in a closed position. In a preferred embodiment, slider **102** and door **104** are on adjacent faces, as shown. Boss **106** which is a feature of the door **104**, is also shown. Boss **106** protrudes through leader **108** and aids in securing leader **108** while stored in the cartridge **100**. In a preferred embodiment, compression spring (not shown) maintains pressure to hold door **104** closed.

Figures 2A and 2B show the innovative tape cartridge of **Figure 1**, but with door **104** in an open position. **Figure 2A** shows a rear corner view with cartridge slider **102** in a retracted position. Door **104** is also shown in a retracted, or open, position.

Figure 2B shows the innovative cartridge **100** with door **104** in an open or retracted position, and boss **106** is visible within the body of cartridge **100**. With door

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104 open, leader 108 is now accessible to the threading mechanism (not shown). In a preferred embodiment, leader 108 attaches to the medium within the cartridge so it can be threaded through a reader when inserted into a drive.

5 In preferred embodiments of the present invention, slider 102 is attached to door 104 by a belt or other pliable member. The function of the innovative assembly is discussed with reference to **Figures 3A-3B**.

Figure 3A shows innovative cartridge 100 and drive
10 300. Cartridge 100 includes reel 310 with medium thereon, attached to leader 108. Boss 106 protrudes through leader 108, and compression spring 312 maintains door 104 in the closed position as shown. Attached to door 106 is belt 314. Belt 314 preferably attaches to slider 102 and bends
15 around belt post 316. Belt post 316 is preferably located at the corner of cartridge 100 and provides rigidity for belt to turn the corner, allowing slider 102 to be placed on a different facing of cartridge 100 from door 104, as shown.

20 Drive 300 is shown positioned to receive cartridge 100. Elevator 318 and file reel motor 320 are depicted, along with cartridge slider engagement tab 322 on the interior of drive 300. Slider engagement tab 322 is preferably aligned so that as cartridge 100 is inserted
25 into drive 300, tab 322 meets with slider 102 and moves slider 102. Moving slider 102 causes door 104 to open, since slider 102 and door 104 are connected by belt 314. As tab 322 forces slider 102 back, belt 314 pulls door 104 open to expose the medium inside. Door 104 preferably
30 slides parallel with rear facing of cartridge 100 so that

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no added volume within drive 300 is required for door to open.

As tab 322 moves slider 102 and door 104 opens, boss 106 which is attached to (or part of) door 104, also moves, compressing spring 312. This configuration is depicted in **Figure 3B**.

Figure 3B shows cartridge 100 inserted into drive 300. When cartridge 100 is inserted into drive 300, engagement tab 322 moves slider 102 such that belt 314 moves door 104. Door 104 preferably slides parallel to the face of cartridge 100 but other mechanisms can also be used. For example, door 104 could also swing on a hinge, though this embodiment is less preferred. As door 104 retracts or opens, door 104 compresses spring 312. Spring 312 provides the force necessary to close the door when cartridge 100 is removed from drive 300. Spring 312 also provides nominal force for ejecting cartridge 100 from drive 300. This advantage can be used to simplify drive 300 if applicable, by eliminating an existing ejection mechanism. For example, once drive 300 disengages from media 324 of cartridge 100, and cartridge 100 is free to slide within drive 300, spring 312 provides force to close door 104, which also causes slider 102 to push against slider engagement tab 322, thereby pushing cartridge 100 toward the opening of drive 300.

The description of the present invention has been presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and

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variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of
5 ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.